

Active Transportation Implementation Plan:

**BICYCLE WAYFINDING
PROTOCOL**



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Acknowledgements

Salt Lake County (SLCo) would like to acknowledge and thank the citizens and agency staff that served on the Wayfinding Working Group for this plan.

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I. Introduction



Wayfinding assembly, Washington, D.C.
(Photo credit: Toole Design Group)

ABOUT THIS PROTOCOL

This document is a planning-level protocol for the implementation of a bicycle wayfinding system in Salt Lake County. The protocol draws on national guidance and best practices while also addressing local objectives and conditions. It is intended to help Salt Lake County and its implementation partners guide bicyclists to major destinations and bikeways through the County, in support of the establishment of a county-wide high comfort bicycle network.

PROCESS

A Wayfinding Working Group was convened with representatives from key stakeholders, including Salt Lake County, citizen advocates, Salt Lake City Transportation Division, National Park Service (NPS)—Rivers and Trails Program, Utah Transit Authority, Jordan River Commission, Wasatch Front Regional Council, and Utah Department of Transportation (UDOT).

The group met four times during 2016 and provided input on the scope, content, signs, and implementation considerations of the protocol.

WAYFINDING BASICS

Why a comprehensive wayfinding system?

Bicycle wayfinding signs provide basic information about destinations, directionality, and distances, to help bicyclists plan their routes and navigate the bike network with confidence.

A comprehensive bicycle wayfinding sign system, therefore, complements a planned bicycle network. The ways in which wayfinding signage help create a transportation system that supports bicycle use and safety include:

Navigation

- To promote the use of preferred bike routes and to encourage bicycling on designated corridors, in particular, high-comfort bikeways
- To provide guidance along routes which are not intuitive or are different from those followed by motorists
- To provide navigational assistance to popular destinations

Safety

- To provide a visual cue for motorists that bicyclists should be expected on streets, potentially increasing driver awareness of bicyclists
- To direct bicyclists to bikeways that are appropriate for their skill level
- To increase the overall number of people bicycling, which has been shown to increase safety

Encouragement

- To provide a higher level of comfort and confidence for people choosing to travel by bike
- To show how easy (or quick) it is to get to destinations by bicycle
- To create a visual image of the bicycle in the roadway environment, and in turn, market bicycle transportation

WAYFINDING GUIDANCE

What is the existing guidance on wayfinding?

The following manuals provide guidance on specific aspects of bicycle wayfinding. A brief description of the guidance available in each manual is included below.

Manual on Uniform Traffic Control Devices Guidelines

The Manual on Uniform Traffic Control Devices (MUTCD, 2009 edition) includes guidance and standards for:

- Sign design for bicycle guide signs, bicycle routes, and auxiliary plaques
- Sign installation details such as minimum height of signs from the ground and horizontal placement from edge of the roadway or trail
- Symbols and appropriate abbreviations for destination names
- Sign examples
- Sign placement, mounting height requirements, sign size, and layout

The MUTCD introduces sign types and provides additional right-of-way placement guidelines for directional signs. Finally, the MUTCD has a section on community wayfinding, which provides information about customization.

The AASHTO Guide for the Planning, Design and Operation of Bicycle Facilities

The American Association of State Highway and Transportation Officials (AASHTO) Guide provides additional information that supplements the MUTCD. The guide explains the use and benefits of different sign types for bicycle wayfinding. It also provides guidance on where to use signs: on what types of routes and how to place signs at intersections. A new edition to be released in 2018 will include expanded guidance in a full chapter on wayfinding.

NACTO Urban Bikeway Design Guide

The National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide provides guidance based on current best practices in large cities. It covers types of signs and destinations, pavement markings, typical applications, and design guidance.

Guidance Limitations and Needs

These guides do not provide information on how to implement a wayfinding system within a specific municipality or region. As a starting point to accomplish this task, the structure of this protocol is organized around these framing questions:

- What objectives are intended to be met with this wayfinding system?
- Who is the wayfinding user?
- What are the needs of a wayfinding user?
- In what ways can the wayfinding system be customized for local conditions?

PROTOCOL OBJECTIVES

What objectives are intended to be met with this plan?

The Wayfinding Working Group developed the following objectives to define the scope of the wayfinding protocol:

Develop a bicycle wayfinding standard that can be used on transportation and recreation routes, including multi-use trails, in Salt Lake County. The standard should:

- Align with MUTCD and UDOT standards and guidelines to the degree possible
- Be flexible, simple, and easy to implement

Establish a sign standard that allows for multiple brands including the following:

- Salt Lake County local/jurisdictional branding
- High comfort bicycling network
- Route type

Ensure that sign and pavement marking standards are clear and logical by:

- Addressing appropriate use of pavement markings, signs, and combinations of both
- Providing strategies for limiting sign clutter and improving clarity

This document provides a wayfinding protocol for the bicycle route sign system. It includes the proposed pattern of signage, graphic design standards, summary information regarding specifications for signs, contextual guidance and placement practices, prioritization, and implementation. From this protocol detailed engineering, fabrication, and installation plans can be developed to implement the signed routes.



DESIGN USER

Who is the design user and what are their needs?

This bicycle wayfinding protocol is designed for the following types of people:

- Those new to bicycling for transportation purposes
- Those new in a community
- Those unfamiliar with a neighborhood through which they are traveling
- A wide range of users of varying abilities and familiarity with Salt Lake County including residents, visitors, and tourists

WAYFINDING BEST PRACTICES

What are the needs of a wayfinding user?

Wayfinding can be defined as best practices for “providing necessary clues and environmental information”¹ to help people find their way in an environment. This protocol draws on wayfinding principles developed for urban wayfinding for all modes, and best practices for bicycle wayfinding from the cities of Oakland, Chicago, Seattle, and Ft. Collins as well as other resources on wayfinding principles.

Wayfinding practices for people traveling by bicycle differ from those used for people traveling by motor vehicle or even people walking. For example, the speed at which bicyclists travel affects the amount of time needed for decisions. Perhaps most critically, wayfinding for bicyclists must account for bicyclists’ sensitivity to distances, topography, and roadway attributes such as number of travel lanes, vehicle speeds, and volumes. Effective wayfinding for users of all ages and abilities will take these factors into account to develop a system that balances intuitiveness, directness, and a sense of comfort.

1 Gibson, David. *The Wayfinding Handbook. Principles of Environmental Graphic Design.* Princeton Architecture Press: NY (2009): P. 13.

The basic process of wayfinding involves four steps, described below. The signs in this protocol respond to the first three steps.

Orientation refers to determining one's location relative to nearby objects [or landmarks] and the destination.

Route decision refers to choosing a route to get to the destination.

Route monitoring refers to monitoring the chosen route to confirm that it is leading to the destination.

Destination recognition is when the destination is recognized.

Lidwell, William, Kristina Holden and Jill Butler
Universal Principles of Design. Rockport
Publishers, Beverly, MA (2010), p. 260.

CORE PRINCIPLES

This protocol is based on the following core principles:

Intuitive

The system addresses the first three stages of wayfinding (described above: orientation, route decision/navigation, route monitoring). It is easy to follow.

Progressive

The system makes sense by meeting the user's needs for information at each location and sequence of the journey. The system provides the right amount of information at each point in the sequence.

Legible and Simple

Clear, easy to use, and understandable by a wide audience. Uses minimal signs, strives to avoid clutter and confusion.

Flexible

The system responds to local conditions and reinforces people's mental maps.

Safe

The system guides bicyclists to avoid unsafe bike movements.

2. Wayfinding Elements

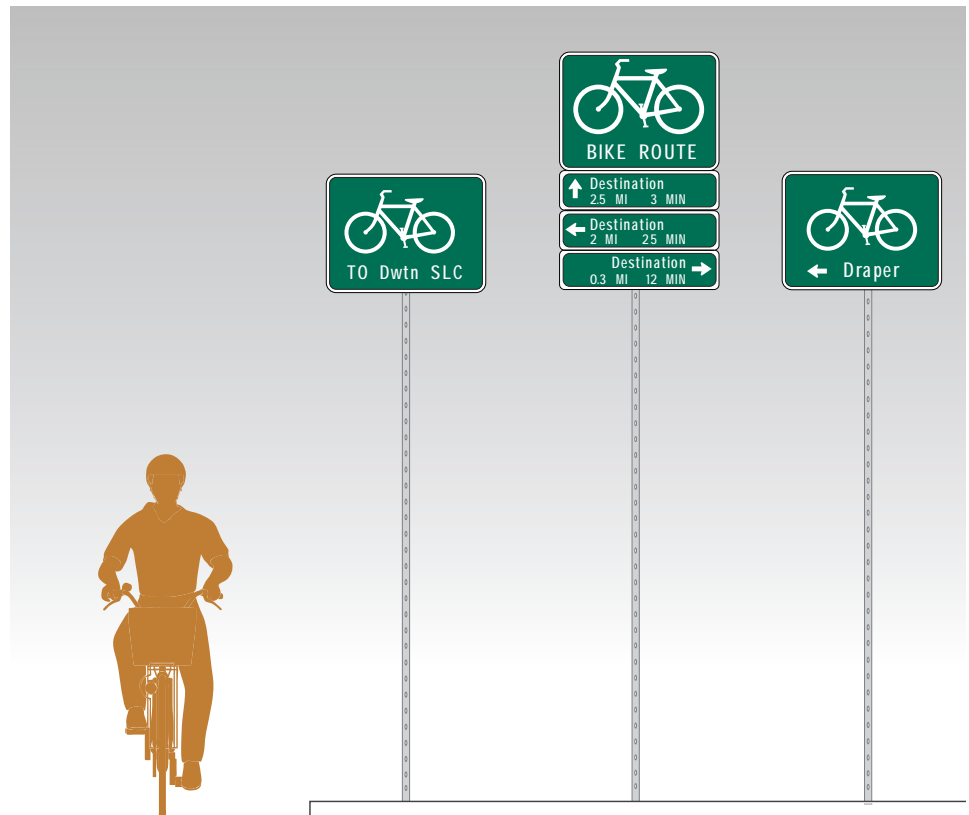


Figure 1: Three fundamental sign types, from left to right: Route identification/confirmation signs, decision signs, and turn signs



D11-1



D11-1c

Figure 2. MUTCD Bicycle Route Guide Signs

THREE FUNDAMENTAL SIGN TYPES AND ELEMENT PLACEMENT

This section describes the basic tools of a wayfinding system. The system will provide three general kinds of guidance, as shown in Figure 1:

- Route identification/confirmation
- Decision signs
- Turn signs

Consistent with the protocol's core principles, sign placement should strive to be intuitive, progressive, legible and simple, and promote safe bicycle travel. More detailed placement information can be found in the sign assembly information in **Implementation**, page 28.



Example route identification/confirmation signs (Photo credit: Toole Design Group)



Example route decision sign assembly (Photo credit: Toole Design Group)



Example decision signs, showing option without D11-1 panel (Photo credit: Toole Design Group)



Example turn sign assembly (Photo credit: Toole Design Group)

Route Identification/Confirmation Signs

Based on MUTCD Bicycle Route Guide Signs, D11-1 and D11-1c (Figure 2).

- These signs **identify a designated bikeway and confirm that bicyclists are on the correct route**, such as after a turn.
- Standard MUTCD route identification/confirmation signs are “blaze” panels 18 inches tall by 24 inches wide with a bicycle symbol. Panels may include a route or trail name, or simply, “Bike Route”.
- Confirmation signs should be **placed at the far side of an intersection after a turn**, preferably visible to the bicyclist prior to completing their turning movements.
- Route identification signs mark the start of a route.
- Signs should be placed every 1/4 to 1/2 mile on off-street routes or every 2-3 blocks on-street, if no decision/turn has been made, in order to reassure riders that they are traveling in the right direction, or to let new bicyclists coming from side streets know they are on a bike route.
- Confirmation assemblies are optional on secondary bikeways at intersections with primary bikeways or regional trails, although they can be used to help provide navigational assistance to a popular destination.

Decision Signs

Based on MUTCD Destination Signs (D1 series), these may be paired with D11 series signs (Figure 3, page 8).

- Decision signs provide guidance **where there is a route decision to be made**, such as where two or more routes intersect, or where other guidance is required. They provide destination, distance, and direction information.
- Decision signs are horizontally-formatted “fingerboard” or “blade” signs 6 inches tall by 24 inches wide. The sign length may be extended to 30 or 36 inches wide as needed to accommodate destination information and arrows to inform decision-making. Signs include distance and time.
- Decision sign “assemblies” (a collection of signs on a post) may also include a D11 series blaze above with fingerboards below.
- Decision assemblies without the D11 series blaze may instead include the bicycle symbol, on longer fingerboard (30 or 36”).
- Decision assemblies should have a maximum of three destinations.
- Decision assemblies are installed on bikeways **in advance of intersections or decision points** to show bicyclists how to get to destinations that are easily reached from the bikeway.

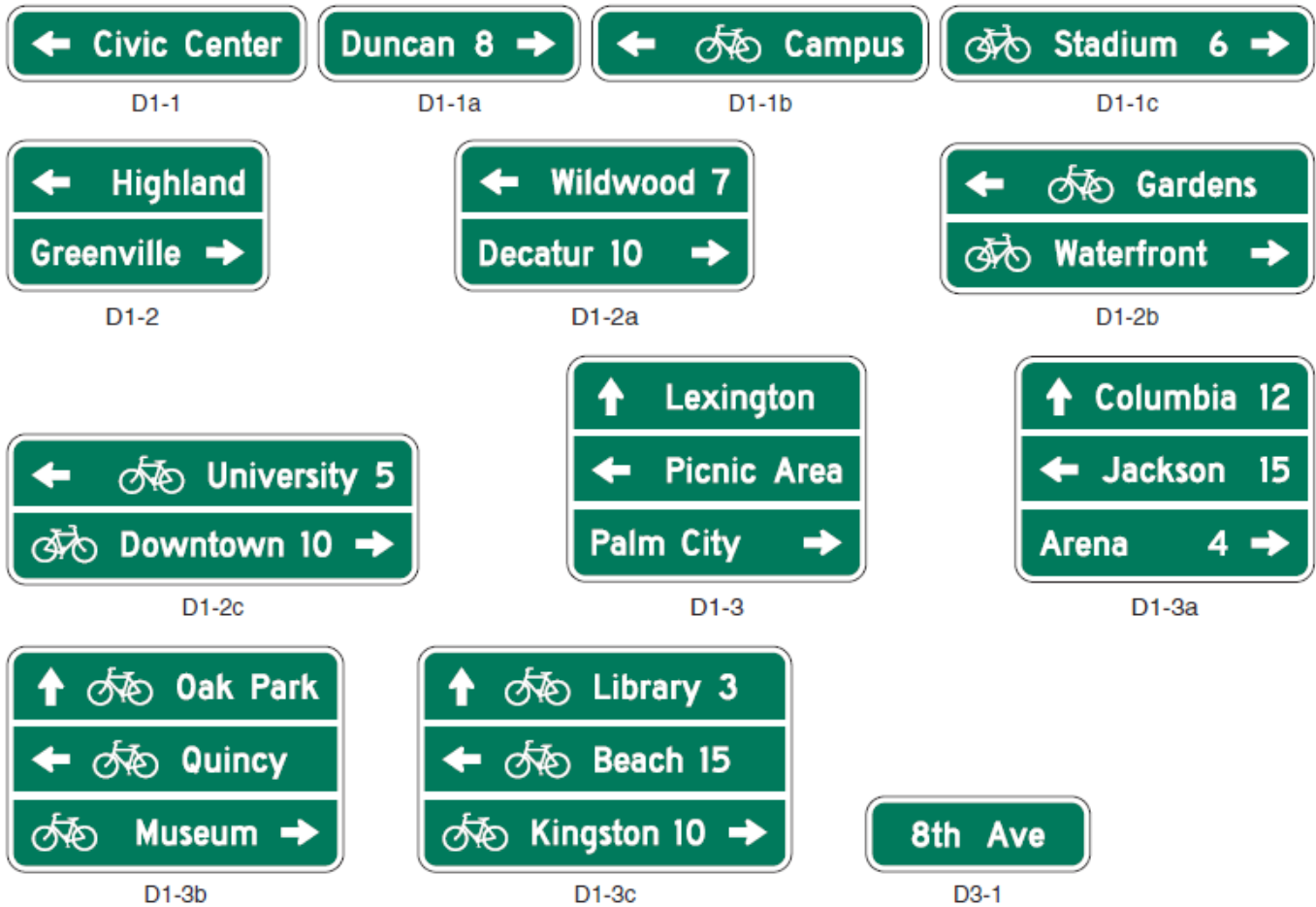


Figure 3. MUTCD Destination and Bicycle Destination signs. Note that separate single destination signs (D1-1 series) are preferred by Salt Lake County over signs that feature multiple destination on a single panel (D1-2 and D1-3 series).

Turn Signs

MUTCD Destination Signs, D1 series and other signs (Figure 3).

- Turn signs are used to indicate a single simple **change in route direction**.
- Turn sign assemblies may include D11 series signs with route or trail name, along with D1 series fingerboards only with destination names and arrows.
- Signs are placed in **advance of a turn in the route**.
- Turn signs are not used at the junction of intersecting bikeways or when a decision sign assembly would be used to indicate destinations off the bikeway.

SUPPLEMENTAL SIGNS

Wayfinding signage should extend to multi-use trails to knit them together with the on-street network. Trail head signs, mile markers, directional signs, and info kiosks are valuable tools to achieving that goal. This protocol does not address supplemental signs specifically, but supports the incorporation of such signs as part of the larger wayfinding system.



Example supplemental signs for multi-use trails (Photo credits: Toole Design Group)



PAVEMENT MARKINGS

Pavement markings may be used to supplement directional signs to help bicyclists navigate difficult turns or where the direction of the bike route is not immediately obvious.

Standard Shared Lane Markings (SLMs) without modifications are the only type of marking that currently complies with MUTCD and FHWA guidance. If federal funding is being used, the standard SLM is recommended practice. Many jurisdictions have developed custom markings, including SLMs with the chevrons angled in the direction of the turn, "bike dots," and custom stencils.



SLMs used for wayfinding (Photo credit: Toole Design Group)



Example alternative pavement markings: SLMs with rotated chevrons. Note that these markings are not approved by FHWA. (Photo credit: Toole Design Group)



Example alternative pavement markings: "bike dots" (Photo credit: Toole Design Group)

3. Salt Lake County Sign Typologies

DEVELOPMENT OF SIGN TYPES

In what ways should the wayfinding system be customized for local conditions?

This protocol proposes a sign system framework to fit the network of existing and planned bicycle routes, including the high comfort bikeways proposed in the County's Active Transportation Implementation Plan (ATIP). The development of the protocol took into account the following types of bicycle trips:

TRANSPORTATION (destination-based)

- On-road bikeways and routes, both local and regional
- Multi-use trails (e.g., Parley's Trail)

RECREATIONAL (distance-based)

- Branded regional routes and loops (e.g., Valley Perimeter Route)
- Multi-use trails
- Out-and-back rides (e.g., City Creek Canyon)

The protocol also considered how to incorporate branding for:

- Salt Lake County/Regional routes
- High comfort routes
- Local/regional/municipal/township routes

Customization and Conformance with MUTCD Standards

The Wayfinding Working Group discussed the value of adhering to state and national signage standards, especially in regard to implementing the signage protocol across a county-wide bike network. At the same time, the group expressed interest in incorporating branding as an additional layer of information. For this reason, the proposed system is based on MUTCD-style wayfinding sign layout for the sake of consistency and ease of implementation, but incorporates specific modifications and additions to create a wayfinding system that reflects Salt Lake County's goals.

Advantages to using MUTCD-style wayfinding sign layout

- MUTCD signs have been studied and found to be effective for both street and multi-use trail environments
- Signs from the street environment promote safe operation on multi-use trails because most bicyclists are familiar with street signs
- People with vision disabilities—as well as those with normal eyesight—find it easier to look for a specific color and layout of wayfinding signs
- MUTCD-style signs are often less expensive to fabricate and more durable than wayfinding signs that are designed for their aesthetic appeal
- MUTCD-style panels are easy to replace and modify for an expanding network



Examples of specialized signage developed by other cities to brand high comfort bikeways (bicycle boulevards, neighborhood greenways/byways)

TOP to BOTTOM: Santa Rosa, CA; Seattle, WA; Portland, OR; Berkeley, CA (Photo credits: Toole Design Group)

BRANDING HIGH COMFORT ROUTES

Traditional “bare-bones” bicycle wayfinding systems direct people to preferred routes, but typically do not provide any information about distance, travel time, or comfort level. As nationwide interest in providing and identifying high comfort bikeways has grown, several jurisdictions have developed specialized signage for use specifically on neighborhood byways (also known as bike boulevards). For example, Berkeley and Portland use capstone signs or sign toppers to indicate these high comfort, “all ages and abilities” routes.

Because the keystone of the development of the Salt Lake County bicycle network is high comfort bikeways, this wayfinding protocol proposes the incorporation of distance, travel time, and comfort information.

It is important to keep wayfinding signs as simple and intuitive as possible while incorporating this additional information. Rather than burden sign users with jargon or unfamiliar concepts, the protocol proposes to designate high comfort routes by replacing the MUTCD standard bicycle symbol on both blaze and fingerboard panels, where appropriate, with a symbol that includes a bicyclist on a bike that conveys the “all ages and abilities” concept. Using a bicyclist, rather than just a bicycle, humanizes the symbol and conveys the concept of high comfort. The Wayfinding Working Group considered and chose an alternative bicyclist symbol, which was customized with input from committee members.



Local example of MUTCD M1-8a Bicycle Route sign for named route. Note that QR codes prohibited by MUTCD (Photo credit: Becka Roof)



Example of custom branding panel, Fitchburg, WI (Photo credit: Toole Design Group)



Example of a mountain pass cycling milestone sign, French Pyrenees (Photo credit: http://www.cycling-challenge.com/relais-du-mont-du-chat/cycling_milestones)

ROUTE BRANDING

The MUTCD M1-8 (for numbered routes and M1-8a for named routes) signs were determined by the Wayfinding Working Group to have limited usefulness for branding routes due to the smaller sign size and oval shape, which make the incorporation of route names and custom artwork challenging. The Wayfinding Working Group considered various ways to incorporate branding in signs and assemblies. After exploring several options, the group settled on a separate sign panel that can be added to route identification/confirmation, decision, and turn assemblies to provide route names and logos. This approach was considered the best solution in terms of flexibility, and clarity. Additionally, this solution could also accommodate high comfort route branding.

MOUNTAIN PASS CYCLING MILESTONES

An additional type of sign was proposed to address “out-and-back” canyon and mountain pass rides. These signs were inspired by European examples that provide information to recreational cyclists about their current position in regard to the summit of mountain passes as they ascend. The idea was to provide signs with distance, elevation, and grade information at logical milestones. The purpose of these signs is more informational than wayfinding in purpose, similar to historical markers. Given the amount of information on these signs, mountain pass cycling milestone sign designs were designed with a different readability standard than true wayfinding signs which are designed to be read and understood quickly..

SIGN TYPOLOGY, SIGN PANEL DESIGN, AND LAYOUT

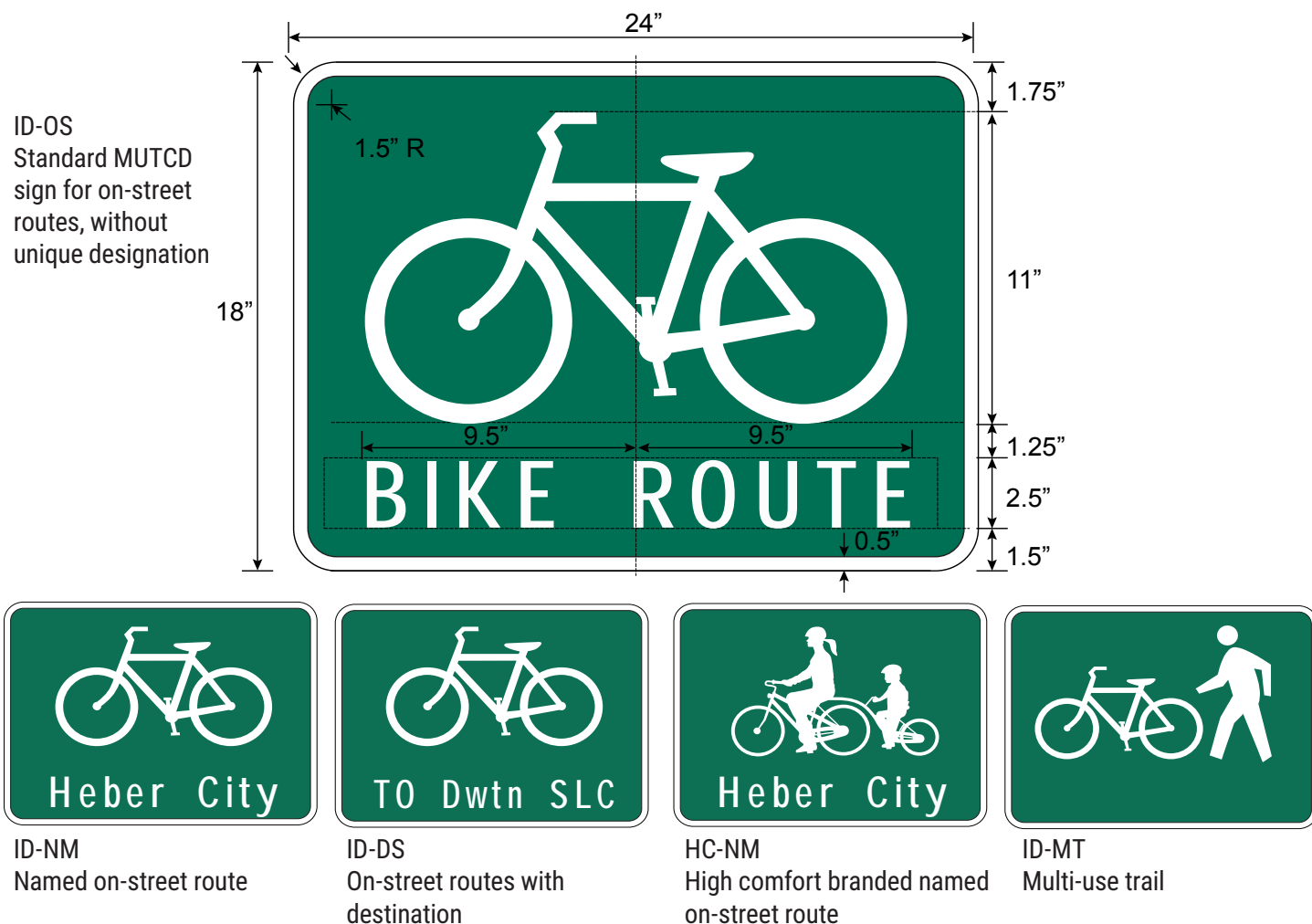
The wayfinding sign system to be used in Salt Lake County uses the three fundamental sign type assemblies: decision assemblies, confirmation assemblies, and turn assemblies.

The following pages provide layout and assembly details of the sign types that will make up the Salt Lake County bicycle wayfinding system. Simplified codes have been assigned to each of the panels:

- Route identification/confirmation panels: ID signs
- Bicycle guide signs for fingerboard panels: FB signs
- Route branding for high comfort routes: HC signs
- Route branding for named routes: RB signs
- Mountain pass cycling milestones: CM signs

These sign types, along with specialized signs for mountain pass cycling milestones and pavement markings, will be described in detail below. Following this section is information on how signs are combined in sign assemblies.

Route Identification/Confirmation Sign Layout



Sign Function and Application

Route Identification/Confirmation for:

- ID-OS Generic on-street routes
- ID-NM Named routes (to be used in place of M1-8a)
- ID-DS On-street routes with destination
- HC-OS, HC-NM, HC-DS, HC-MT High comfort routes
- ID-MT Multi-use trails

Size and Features

MUTCD standard:

- 18 inches tall x 24 inches wide
- Standard color and bicycle symbol

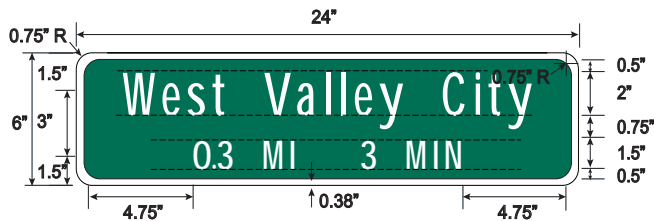
Font

Highway Gothic, min. 2 inches capital letter height, larger preferred

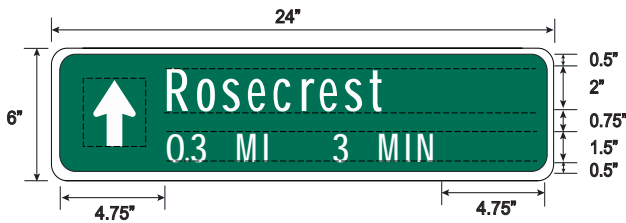
Best Practices

- Destination names use title case
- The word "TO" is all uppercase
- For long route names, size of font may be reduced to 2 inches height to fit name on sign, or kerning can be reduced

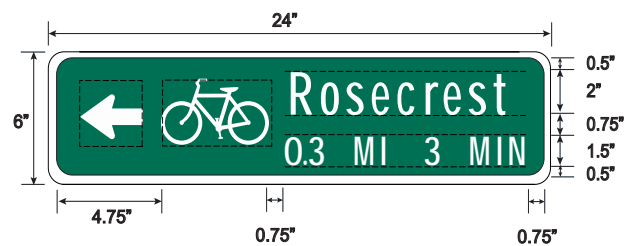
Fingerboard Sign Layout



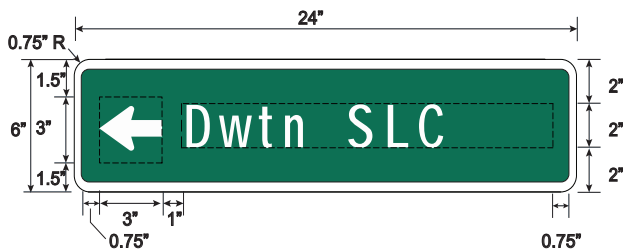
FB-DD for Route Identification/Confirmation assemblies
Fingerboard destination + distance, time



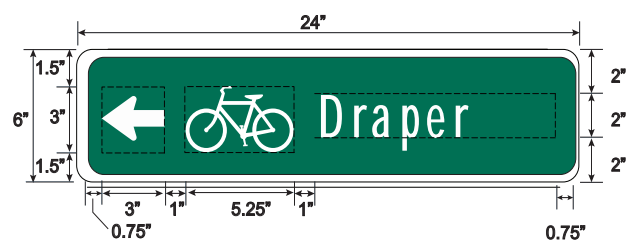
FB-ADD for Decision Assemblies
Fingerboard arrow + destination + distance, time



FB-ADDb
Fingerboard arrow + destination + distance, time + bike symbol



FB-AD for Turn signs
Fingerboard arrow + destination



FB-ADb
Fingerboard arrow + destination + bike symbol

Sign Function and Application

- Displays the names of destinations or named bikeways that can be reached from the current bikeway, along with direction, distance and time to the destinations
- Fingerboards with bike symbols can be used without ID signs

Size and Features

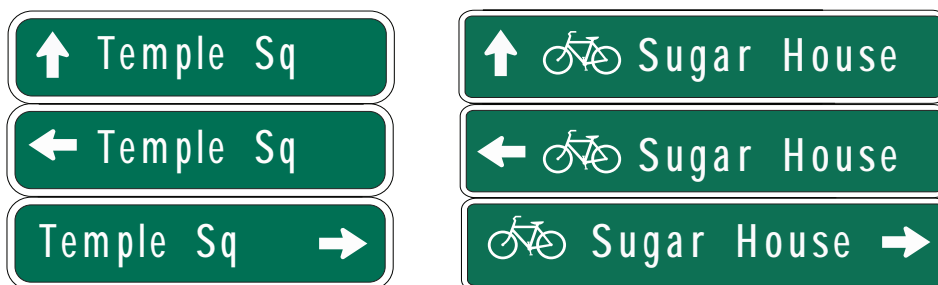
- Standard size, 6 inches tall x 24 wide
- Size may be increased to accommodate additional information, symbols, longer destination names. Standard width increments are 24, 30, and 36 inches

Font

- Highway Gothic, minimum 2 inches capital letter height, title case
- For long route names, size of font may be reduced to fit name on sign, or kerning can be reduced
- Maximum length for single line destination: 10-14 characters, with space
- Text size for distances and time: 1.8 inches

Fingerboard Sign Layout Best Practices

Fingerboard signs samples showing arrow order and placement, with and without bicycle symbol



Spacing

- Standard horizontal spacing between the main elements of a fingerboard (arrows, text, symbols, and distance) is one inch; the recommended minimum spacing is 0.75 inch

For long names that do not fit on one line, use the following order of preference:

1. For destinations slightly longer than one line, use kerning to compress the font horizontally to no less than 90% of standard size
2. Use intuitive abbreviations in the destination names. See list of standard abbreviations, page 35

Order of Destinations

- Signs should be grouped and oriented to show all through destinations (up arrow) first, then left turns, then right turns
- Destinations should then be ordered, from top to bottom, from nearest to farthest order (e.g., 0.3 mi, 0.5 mi, 1 mi) so that all through destinations are listed first, nearest to farthest, and so on with left turns and then right turns
- Salt Lake County has chosen to use separate fingerboards for maximum flexibility, however, fingerboards may be combined into a single sign panel

Symbols

- Through and left arrows always appear on the left side of the sign; right arrows on the right side of sign
- Symbols for bicycle/pedestrian modes should always be placed immediately to the left of the legend text, regardless of the arrow placement
- Symbols for services/amenities should be placed immediately to the left of the legend text

Distance

- Distances to destinations should be measured from centers of intersections, destination entrance or center of neighborhood; consistency is important (see page 27 for information on **Measure-to Points**)
- When distances are less than one mile, a zero is placed before the decimal, e.g., 0.5 MI. When the distance is an even number, a zero is not used, e.g., 3 MI



- Miles should be abbreviated to “MI” to distinguish from minutes (MIN)
- Distances under 5 miles should be rounded to the nearest tenth of a mile; 5-10 miles, to the nearest half-mile; and over 10 miles, to the nearest mile
- Distance should be included (over 0.3 miles), whether or not time is included on signs

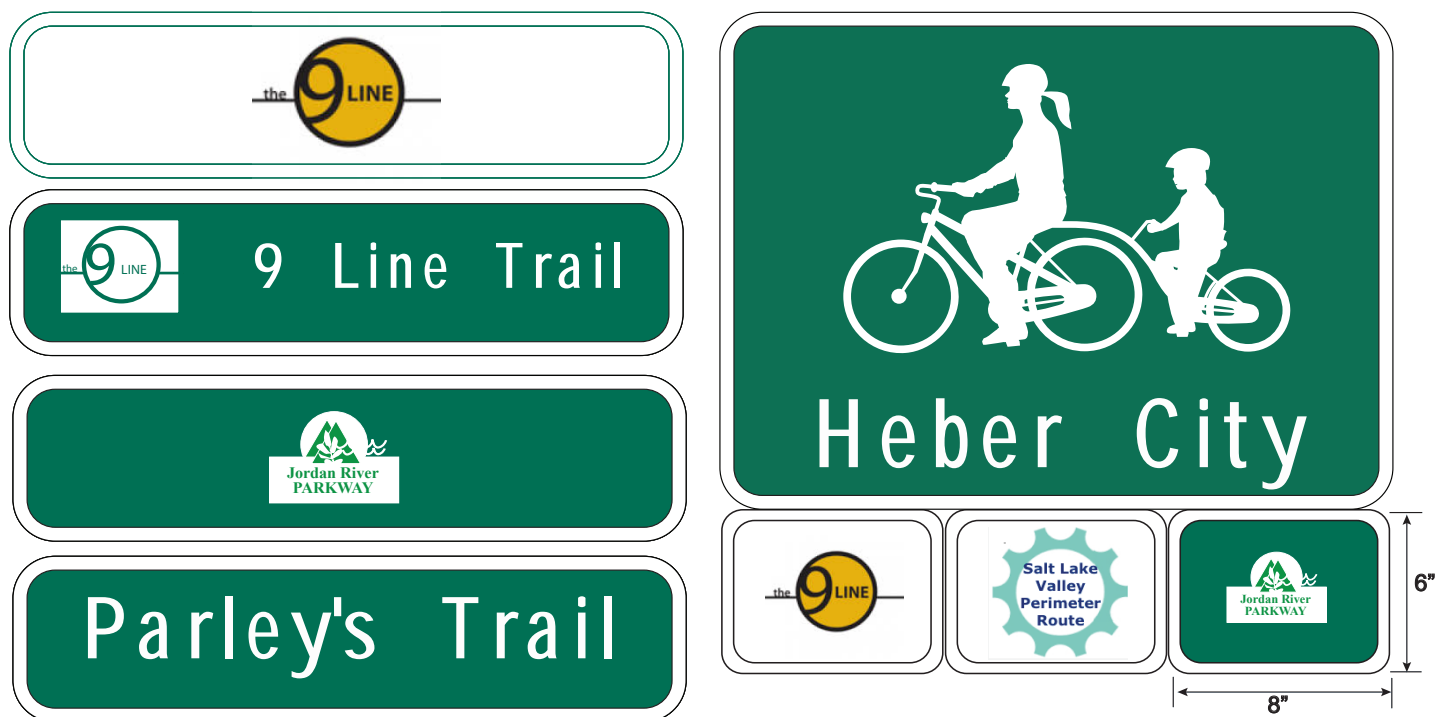
Time

To the casual bicyclist who will depend on wayfinding signs, the approximate time to reach a destination is likely a more useful measurement than distance. Including travel time also serves bicycle encouragement efforts by discreetly pointing out how quick it is to travel by bicycle.

- Time estimates are less useful for distances over 5 miles (30 minutes). If times over 30 minutes are included, they should be rounded to the nearest 5 minutes (e.g., 42 minutes becomes 45 minutes)
- It is not recommended to include time estimates in rural areas where destinations are far apart

See **Standards for Measuring Time and Distance**, page 27, for more detail about speed, distance, and time.

Route Branding

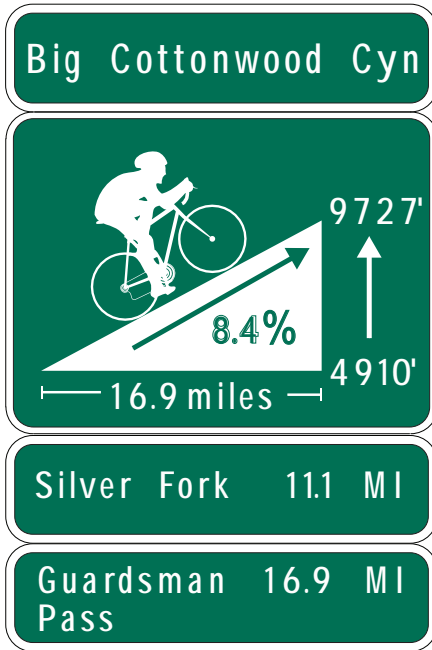


RB-FB
Route branding option for route name and/or logo (with sample logos)

RB-SP panels below HC-NM
Route branding option for route logo, for branding multiple routes (with sample logos)

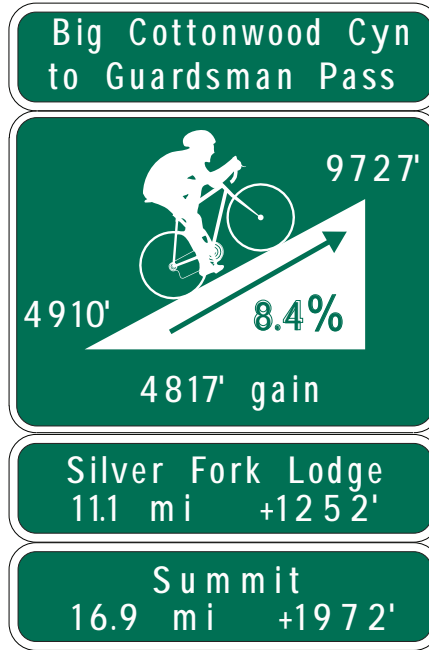
<p>Sign Function and Application</p>	<p>Route branding for:</p> <ul style="list-style-type: none"> • Named regional rides, e.g., Great Salt Lake Marina Route, use in place of M1-8a signs with ID signs • Multi-use trails (e.g., Parley's Trail)
<p>Size and Features</p>	<p>RB-FB 6 x 24 inch fingerboard RB-SP 6 x 8 inch panels (0.75" radius on corners) Color as follows:</p> <ul style="list-style-type: none"> • Green field for white logos • White field for color logos
<p>Font</p>	<p>N/A</p>
<p>Best Practices</p>	<p>For use with route identification/confirmation assemblies. RB-FB signs appear at top of assemblies. RB-SP appear at bottom of assemblies</p>

Mountain Pass Cycling Milestones



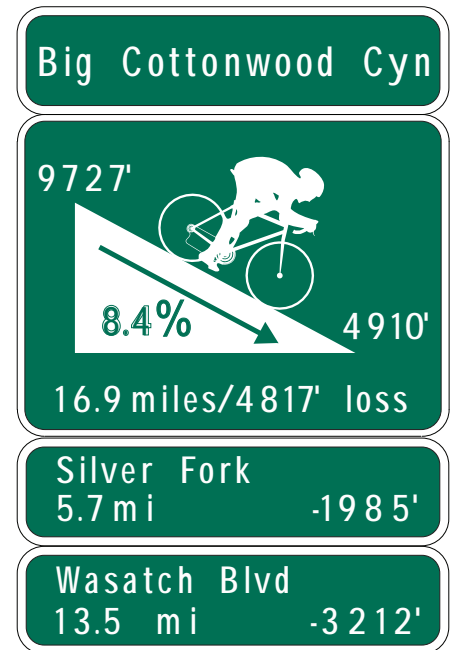
CM-U1

Option 1: Ascent with simple information



CM-U2

Option 2: Ascent with detailed information



CM-D1

Option 3: Descent

Sign Function and Application

To provide additional route-specific information for recreation-oriented cyclists

Size and Features

- Custom sign, 18 inches tall x 24 inches wide
- White text on green background
- Add fingerboards to indicate distance to rest stops/landmarks

Assembly Guidelines

- On main panel, include distance to end point, starting/ending elevation, and average grade
- On fingerboards, include destination name and distance

Placement Guidelines

- Every 5 miles, minimum, or at logical rest spots/landmarks, as well as turn-arounds and end points

SIGN ASSEMBLIES

The following section provide details about how the signs are to be combined into assemblies.

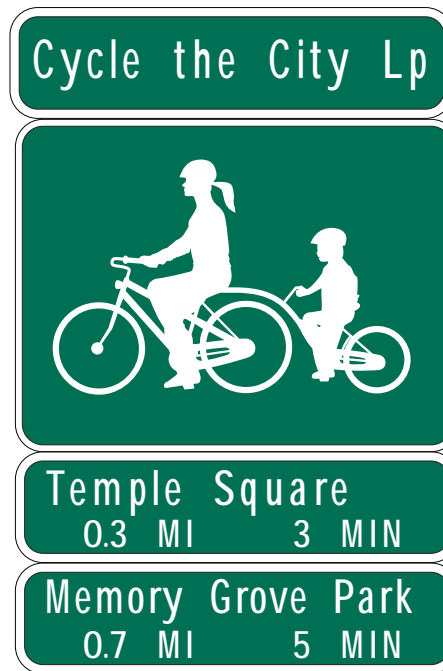
General Guidance for All Assembly Types

- No more than four sign panels should be included on any single sign pole, due to the need to maintain head clearance for pedestrians and because of the limited amount of information a person can process while moving.
- For assemblies mounted on the same post but perpendicular to each other, group the panels that face the same direction together.
- Do not install wayfinding signs with warning or regulatory signs.

Route Identification/Confirmation Sign Assemblies



ID-DS above with FB-DD below
Route identification/confirmation, for on-street bikeway and destinations



RB-FB above with HC-OS and FB-DD below
Route identification/confirmation for named, high comfort on-street bikeway, with destinations



RB-FB above with ID-MT
Multi-use trail route identification/confirmation

Features and Assembly Guidelines

Route identification/confirmation assemblies use a route identification panel (ID or HC) and fingerboard panels (FB) that indicate distance and time, but not direction. Direction is shown on decision signs. Route Branding (RB) panels may also be added at the top of the assembly.

- On fingerboard, the closest destination shall be listed on top and the farthest destination shall be listed on the bottom
- If two or three destinations are close together, select a single location (e.g. "Downtown") that serves all destinations

Decision Sign Assemblies



ID-DS + FB-ADD

Typical decision sign assembly



HC-DS + FB-ADD

Decision sign assembly with high comfort branding

Features and Assembly Guidelines

- Decision assemblies usually include a combination of route identification panel (ID or HC) and fingerboard panels (FB) that indicate direction, distance, and time
- May also include route branding (RB)
- On fingerboard, the closest destination shall be listed on top and the farthest destination shall be listed on the bottom
- If two or three destinations are close together, select a single location (e.g. "Downtown") that serves all destinations

Turn Sign Assemblies



ID-NM, incorporating arrow

Turn assembly for on-street route, where main route turns



HC-DS, with FB-AD

Turn assembly for high comfort route, where main route continues through and side destination requires a turn/spot direction



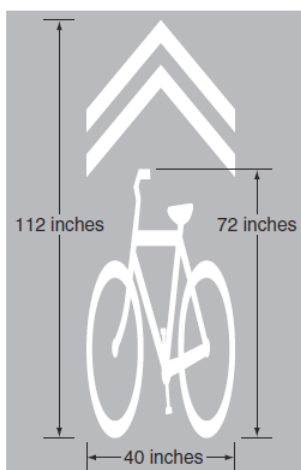
FB-ADb

Single turn sign for use without ID or HC sign

Features and Assembly Guidelines

- Turn assemblies include a combination of route identification/confirmation panel (ID or HC) and fingerboard panels (FB) with direction and destination only, to indicate where there is a turn in the route
- Assemblies may also include route branding (RB) panels
- For simplicity and flexibility, a fingerboard panel with a bike symbol can be used alone

PAVEMENT MARKINGS



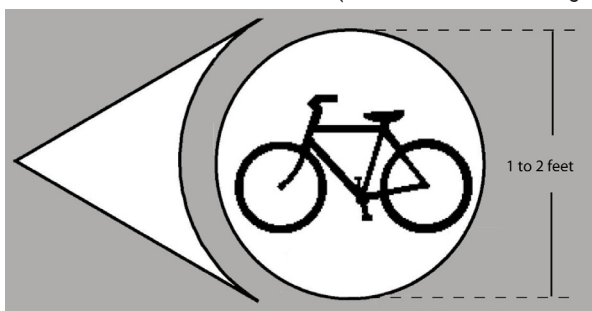
MUTCD Layout for shared lane markings



Standard application of SLMs for wayfinding (Photo credit: Toole Design Group)



SLMs with angled chevrons (Photo credit: Toole Design Group)



"Bike dot"



Application of bike dots (Photo credits: Toole Design Group)

Features

- Pavement markings should be considered an enhancement to proper signage and generally should not be used alone where possible
- Standard Shared Lane Markings (SLMs) are currently the only type of wayfinding marking that complies with MUTCD and FHWA guidance
- If federal funding is being used, the standard SLM is recommended practice
- Custom options include: SLMs with the chevrons angled in the direction of the turn and "bike dots"
- SLMs with the chevrons angled are used at decision points or where the route is unclear
- Bike dots are used in spot locations (e.g., to direct users to a crosswalk)

Layout Guidelines

- SLMs, as per MUTCD Section 9c.07
- For SLMs with angled chevrons, location and angle of chevron should be decided according to context

Placement Guidelines

SLMs should only be used where there is no bikeway present and not on roadway shoulders. They should not be placed on roadways with speed over 35 MPH. Place the pavement markings (SLMs and angled chevrons, bike dots, etc.) in the location and position that best represents the location and positioning that the bicycle should be in to make the turn. This may mean placing the stencils immediately at the turn, instead of in advance of the turn. For complicated turns, the wayfinding sign panels should be used in advance of the intersection to alert bicyclists of an upcoming turn in the route.

SIGN PROGRAMMING AND DESTINATIONS

Identification of Potential Destinations

Planners should use local knowledge and review existing maps and GIS data to develop an initial list of destinations served by the existing or planned bikeway. When selecting destinations, the following should be considered:

- Consider parks, municipalities, central business districts, shopping areas, major sports venues, major bikeways, well-known landmarks (including the street coordinate system), transit locations, and schools (university, high school, middle schools, and elementary schools) along or near the route.
- Individual businesses should usually not be listed as destinations because they can relocate or go out of business, and governments do not want to appear to be favoring specific businesses. If there is a need to sign to an important destination that happens to be a single business, it should be referred to generically, such as “Grocery Store” or “Marmalade District.” Another approach is to use symbols for food or services instead of words.
- Consult user groups, such as “friends” organizations, local bicycle advisory groups, bicycle advocacy organizations, or bicycling clubs.

Organize Destinations into a Hierarchy

To create a legible and intuitive system, destinations can be assigned to one of three groups: Primary, Secondary, and Tertiary, based upon their usefulness as navigational references for bicyclists and their likelihood of being destinations for bicycling trips. The hierarchy will determine how far from a given destination references to it will appear on wayfinding sign panels, and is meant to help planners decide which destinations are included on wayfinding signs.

The general hierarchy of what to include in Primary, Secondary, and Tertiary destinations will vary depending on whether the bikeway is a local or regional route (see Table 1) and whether it is in an urban and or suburban part of the County. In urban areas, destinations are close together and only the most regionally-significant destinations should be noted as Primary destinations. Neighborhood shopping areas and local parks should be included on wayfinding signs to help as navigational and informational aids for bicyclists to know where they can access services such as food, water, and restrooms. A sample hierarchy of destinations for Salt Lake County is shown in Figure 4.

To establish a hierarchy, the following factors should be considered:

- How well-known is the destination and how useful is it as a navigational reference? The most well-known destinations and most useful navigational references should be in the Primary destination group.
- How many people are likely to visit the destination annually? Is the destination commonly accessed by bicyclists and pedestrians? Does the

Figure 4. Destination Hierarchy

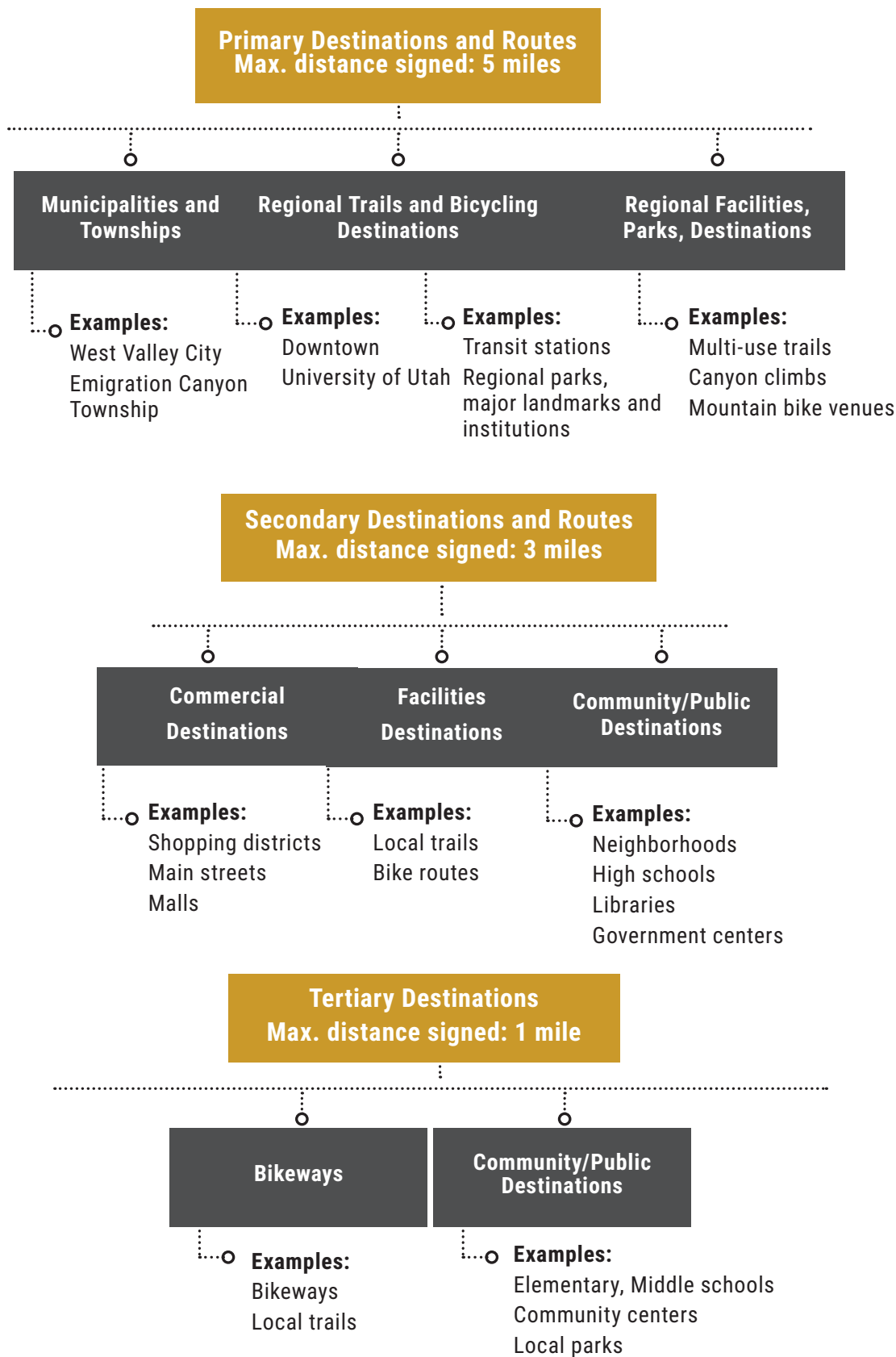




Table 1. Local and Regional Route Distinctions

	Defined as	Typical Route Distance	Destinations Served
Local routes	Within one or two municipalities/ townships	0-4 miles	Serve Tertiary and some Secondary destinations
Regional routes	Passing through two or more municipalities/townships	4+ miles	Serve Primary and some Secondary destinations

route provide good access to the destination? The venues with the most visitors, especially ones who arrive by bicycle, should be in the Primary or Secondary destination group.

- If the destination is a bikeway or a bike trail, how well-known is it? How many people use it? Is it part of a regional bikeway network?
- It may be useful to use the street coordinate system as a wayfinding reference where these roadways make sense as landmarks, such as in areas where there are few significant landmarks. However, care should be taken to distinguish between a coordinate system roadway as a wayfinding destination versus a recommended route, as these roadways may or may not have bikeways or be comfortable for the intended user.
- Neighborhood destinations, such as elementary schools, libraries, and local parks, will usually be in the Tertiary destination group.
- To minimize sign clutter and maintenance costs, only the most popular or useful destinations should be chosen so as to not “over-sign” or contribute to sign clutter.

Destination Names

To make signs clear and legible, destination names should be kept short. For example, use “Salt Palace” instead of “Calvin L. Rampton Salt Palace Convention Center.” One can consult maps, online map services, and local users to finalize how places are referenced on the signs.

STANDARDS FOR MEASURING TIME AND DISTANCE

Distance

In many cases, planners will have more possible destinations that could be included in a wayfinding assembly than space available for them. The destination hierarchy should guide planners when deciding at what distance destinations should be included on wayfinding signs. Suggested distance guidelines for the destination hierarchy are displayed Table 2. In practice, the distance at which each destination appears on wayfinding signs will require the judgement of the person or committee who is planning the wayfinding along the bikeway.

Table 2. Distance Standards*

Context	Primary Destinations	Secondary Destinations	Tertiary Destinations
Urban/Suburban Bikeway	Up to 5 miles	Up to 3 miles	Up to 1 mile
Rural Bikeway	No distance limit	Up to 5 miles, with the exception of trails or trail end points, which have no distance limit	Up to 1 mile

* Distance measures are typically dropped for destinations under 0.3 miles

Formula for calculating travel time

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}} \times 60$$

Time

Bicycle travel time can be included in wayfinding signs as a standard feature to reinforce the concept that many destinations can be reached by bicycle within a reasonable amount of time. A 10 mph average speed may be used to estimate travel time for a typical person. Google Maps takes topography, traffic signals, and other factors into account and can also be used to estimate bicycle travel time. If needed, the formula for calculating travel time is shown to the left.

Measure-to Points

If the destination is a municipality, a large park, or destination with a large area, planners will have to establish a measure-to point.

- For large parks or facilities, measure distance to the nearest main entrance relative to the approach direction.
- The distance to Cities and Townships should be measured to the City's center point--or the civic/commercial center if that is more logical--as is the practice in highway wayfinding. Google Maps' bicycle navigation feature also measures the distance to the City's center point.
- Inside Salt Lake City, distance should be measured to "Dwtwn SLC", the area bounded by North Temple, 200 East, 400 West, and 400 South.

4. Implementation

CONTEXTUAL GUIDANCE AND SIGN PLACEMENT PRACTICES

General Guidance for All Wayfinding Sign Placement

- Typically, bicycle guide signs are placed on the right side of the street. On multi-use trails, they may be placed on the left side of the trail due to space or other constraints.
- Ensure that the arrows on an assembly do not point to a minor side street, alley, or driveway that could be mistaken for the intended turn.
- Where bicyclists are guided to or are likely to use a crosswalk as part of the route, locate guide signs in close proximity to pedestrian signal heads.
- Where some bicyclists may choose to use a sidewalk and others may choose to use the street, signs should be located to serve both locations wherever possible.
- Care should be taken to avoid placing signs in tree canopies or where they will be blocked from view by vegetation, other signs, parked vehicles (especially large vehicles and trucks), and buses at bus stops.
- On urban streets that already have many signs, consider ways to reduce sign clutter. There may already be street signs for motorists that bicyclists will likely see. Bike signs must not be added onto existing poles with regulatory signs (i.e. stop, yield, etc.) However, it is possible to utilize the posts of existing parking restriction signs when placing an assembly, both to reduce sign clutter and save costs. On these streets, limit new signposts and assemblies to only the most critical locations.

Post and Mounting Hardware Standards

Signs and sign posts shall be installed in accordance with local or UDOT standards and specifications. For jurisdictions that don't have their own standard installation specifications, the following may be used:

- The standard pole for bikeway guide signs is a 2-inch square perforated galvanized metal pole. The pole should be placed 18-24 inches below ground, depending upon the overall weight of the signs and the soil/pavement conditions.
- For on-street bikeways next to sidewalks: poles of 12 feet in height are usually of adequate length when installed to accommodate an ID sign with 3 supplementary fingerboard signs, and still maintain sign height standards.

- Longer poles are needed if additional signs will share the same pole and the pole will be sunk deeper in the ground. The ID signs should be installed at 10 feet in height as measured from the top edge of the sign. This height will allow for the installation of supplementary signs while maintaining a minimum 7 feet clearance to the bottom edge of the bottom sign.
- For multi-use trails: poles of 10 feet in height, as measured from where they are installed below ground, can usually accommodate an Identification sign with 2 supplementary fingerboard signs, while maintaining a minimum 4 feet height as measured from the height of the multi-use trail to the bottom edge of the bottom sign.

See Figures 5-7 and Table 3, page 30, for more information on sign installation.

ACCESSIBILITY REQUIREMENTS

The Architectural and Transportation Compliance Board provides guidance for accessible design in the built environment. These standards address the needs of people with disabilities for vertical clearance, post-mounted objects, and clear width. Many of these standards are also outlined in the MUTCD.

CLEARANCE GUIDELINES

Clearance for Urban Roadways

Vertical Clearance

- Minimum of 7 feet from the ground to the bottom edge of the sign

Lateral Clearance

- Minimum of 2 feet from face of the curb to the side edge of the sign (post should be installed at least 3 feet from the face of the curb)
- In dense commercial areas where existing posts are close to the curb: 1 foot from face of curb to edge of sign (post should be installed at least 2 feet from face of curb)
- Signs should not intrude into the pedestrian travelway on the sidewalk

Clearance for Rural Roadways

Vertical Clearance

- Rural roadways: minimum of 5 feet from the pavement to the bottom edge of the sign

Lateral Clearance

- Rural roads: minimum of 12 feet from the edge of the travel lane to the edge of the sign

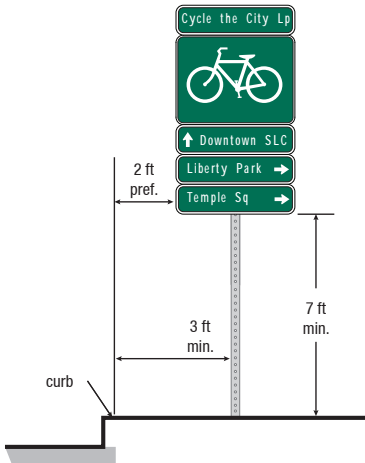


Figure 5. Sign Installation on urban roadways

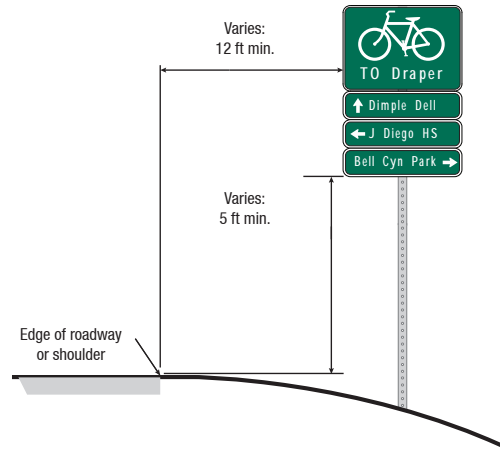


Figure 6. Sign Installation on rural roadways or urban environments without curb

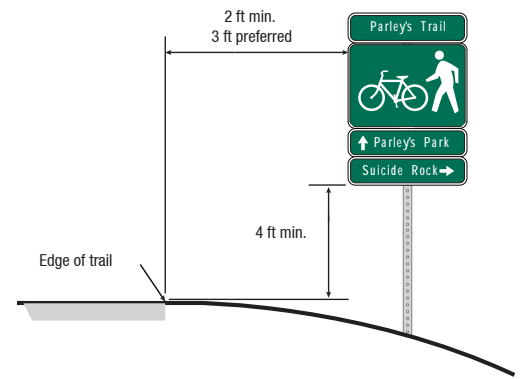


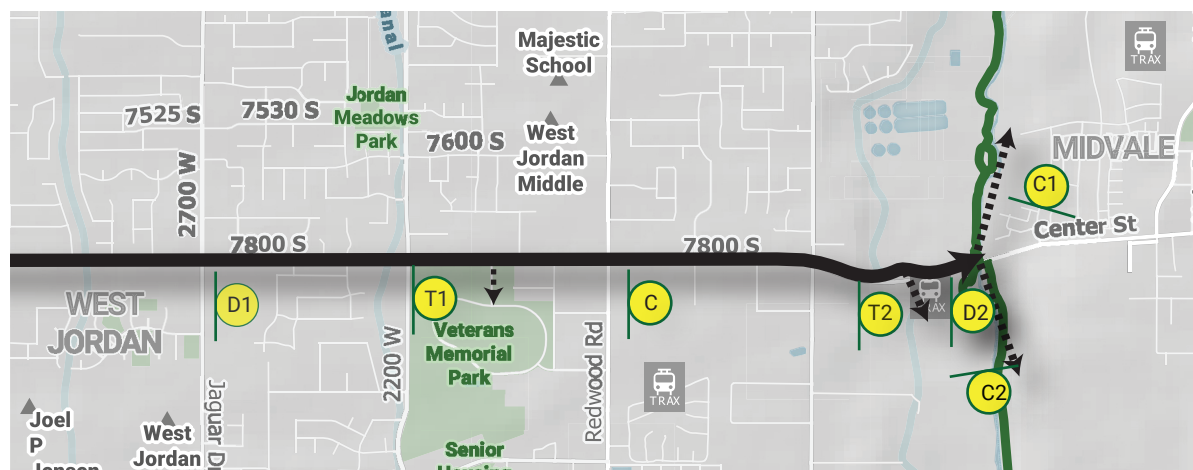
Figure 7. Sign Installation on multi-use trails

Table 3. Sample Sign Installation Standards

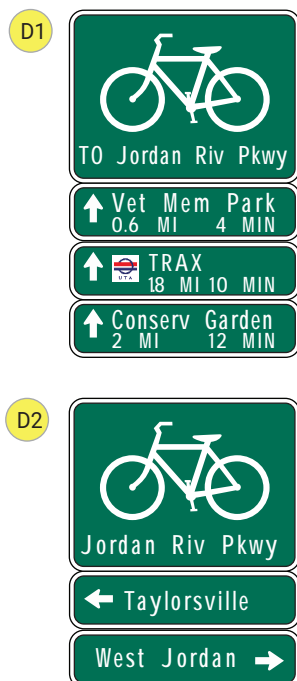
Standard	Standard On-Street Bikeways	Multi-use Trails
Vertical Clearance	<ul style="list-style-type: none"> On rural roads: a minimum of 5 feet from the height of the pavement to the bottom edge of the first sign On urban roads, a minimum of 7 feet from the ground (above the curb) to the bottom edge of the sign 	<ul style="list-style-type: none"> Minimum of 4 feet from the height of the multi-use trail to the bottom edge of the sign For signs placed overhead of multi-use trails, a minimum of 8 feet vertically over entire width of multi-use trail Mile markers along multi-use trails should be installed so the bottom of the sign is 3 feet above the trail surface
Lateral Clearance	<ul style="list-style-type: none"> On rural roads: 12 feet from the edge of the travel lane On roads with curb and gutter: 2 feet from face of the curb to the side edge of the sign, which means pole should be installed at least 3 feet from the face of the curb In dense business or commercial areas where existing poles are close to the curb: 1 foot from face of curb to edge of sign (pole should be installed at least 2 feet from face of curb) Signs should not intrude into a sidewalk 	<ul style="list-style-type: none"> Minimum of 2 feet from the edge of the trail to the side edge of the sign (pole should be installed at least 3 feet from the edge of the trail)
Post Style	<ul style="list-style-type: none"> 12 foot tall square or round galvanized metal post, installed 18-24 inches in the ground 	<ul style="list-style-type: none"> 10 foot tall post, depending on slope of ground away from trail Installed 18 inches to 24 inches in the ground For mile markers, posts can be between 5-9 feet tall (including the length below ground), depending on the slope of ground away from trail

EXAMPLE SIGN PLACEMENT

The following example illustrates the placement of the three primary sign types along the bike network



Decision sign



Turn signs



Confirmation Signs



LEGEND



IMPLEMENTATION GUIDANCE

Signing of the Bicycle Network

The Salt Lake County ATIP recommends a bicycle network that consists of improvements on over 600 miles of roadway.

If a bikeway is part of the ATIP network, it should be prioritized for wayfinding. With its emphasis on developing a high comfort regional bicycle network, the ATIP identifies specific routes that increase the safety and comfort of less confident bicyclists and enhance connections between cities, townships, neighborhoods, schools, commercial centers, transit, parks, and the regional multi-use trail network. As these bikeways identified in the plan are developed and built, wayfinding should be included as part of the construction budgets.

The type and phasing of improvements may vary depending on a number of criteria, including expected user volumes, roadway constraints, vehicle volumes and speeds, feasibility, destinations served, and relative importance in the overall network. Wayfinding is an important component of establishing the network. Wayfinding signs may be used alone or in combination with other treatments such as pavement markings (e.g., bike lanes and shared lane markings). Wayfinding sign installation does not need to occur at the same time as other bicycle network improvements. For example, on some lower speed and volume roads, installation of wayfinding signage may precede the striping of bike lanes, and in this sense could be used as an interim step toward implementing additional recommended treatments.

Priority Bikeways for Wayfinding Signage

Within the high comfort bicycle network, regional routes should be prioritized first and local routes second.

Other factors to take into account when prioritizing wayfinding signage include level of completion of bikeway, need based on demand and use, and the need to close a gap between destinations and bikeways.

High Comfort Branding and Route Readiness

Routes to be branded high comfort must be complete in order to provide a safe and comfortable experience for all ages and abilities. The Salt Lake County Bicycle Best Practices document (available for download on the County's website) will provide guidance on what constitutes a high comfort bicycle route, including segment and crossing treatments. These guidelines should be met before implementing high comfort branded sign assemblies. High comfort routes should begin and end at destinations. For example, if a high comfort route is interrupted by an arterial crossing that has not been enhanced with high comfort crossing treatments, it should not be signed high comfort up to that crossing. Rather, signing of the high comfort route should be discontinued at the nearest destination, e.g., park, transit station, school, etc.

Coordination with Other Jurisdictions on Sign Placement

Many sign plans will require coordination with neighboring jurisdictions because bikeways often cross jurisdictional boundaries. Each jurisdiction needs to be involved in the decision to place signs on their street. If a sign is damaged or vandalized, the City may be responsible for replacing the sign. For that reason, it is important to work with other jurisdictions as soon as the desired sign types and placement of signs on the other jurisdictions' street have been determined.

Mapping Software

Google's "My Maps" tool is a free web-based mapping software that can be used to develop a wayfinding plan. Users can place markers for the wayfinding signs, and add fields to a data table that can include the types of sign panels and the sign content for each map.

Sign Installation Plans

Destination, sign assembly, and layout information can be compiled into a sign installation plan to be shared with a contractor or work crews who will be fabricating and/or installing the signs. A sign installation package may include the following components:

Plan Maps

Scale might range from 1" = 80' to 1"=40' (1:960 to 1:480) depending on paper size. Include a scale and north arrow in the map.

- Paper sizes can be 8.5 x 11 inches or 11 x 17 inches
- Plan maps should use a standard sign symbol so that the orientation of the sign can be discerned and called out by the assembly identification numbers
- Plan maps should include an image for every sign assembly

Sign Assembly and Installation Details for each sign assembly, including:

- Panel sizes and identification codes—such as MUTCD identification numbers and the ID, FB, HC, CM, RB codes used in this manual—for each sign panel in the assembly
- Panel facing direction
- Location on street or trail ("ON Jordan River Pkwy AT 7800 S")
- Post location and post type
- Mounting arrangements and/or adjustments to existing signs on posts
- Special instructions

If using the Google "My Maps" tool, the table can be exported to a KML file, which can then be imported into an Excel spreadsheet

Panel Fabrication Specifications and Details

- Provides typical and variations for each sign panel size; layout of text and symbols; spacing, letter sizes, symbol sizes, symbol types, symbol enlargement or reduction allowances; colors, fonts, and borders
- Provides details for custom symbols, if needed
- Includes sign fabrication standards (see below)

These may be more or less detailed depending on who does the fabrication (e.g., agency sign shop or outside contractors)

A Sign Schedule

This is a table of all the sign panels and is used primarily for calculating quantities and computing cost estimates

- Includes assembly identification codes and numbers (MUTCD and guide codes), panel sizes and types, and post types.
- May also include sign removal locations and instructions

Sign Fabrication Standards

Signs shall be installed in accordance with Salt Lake County, municipal, or UDOT standards and specifications as appropriate

Anti-Graffiti Coating

Graffiti overlays are available as film or liquid laminates. When these are overlaid on a sign, harsh solvents can be used to remove the graffiti without damaging the underlying sign. Some sign vendors may already include "Anti-Graffiti Overlay" as part of the cost of their standard sign fabrication. If they do not, it is worth purchasing this treatment for a small additional cost (typically \$1-2 per sign). Ask the vendors about this when in the process of soliciting bids.



CONVENTIONS

Logos/Icons on Fingerboards

- Jurisdictional and destination logos on route identification/confirmation signs decision and turns signs can help users identify their location more quickly (samples to left).
- Obtain documented permission from jurisdictions and agencies to use logos.
- Jurisdictions have the choice between showing logos in full color on white or in MUTCD green and white.
- If the green and white version is selected, two-color versions of each logo are required for sign production. Black and white logos can easily be converted to green and white for placement on signs.
- Standardized colors and fonts comply with MUTCD guidance and aid in the legibility of signs.
- Sign color is to match MUTCD specifications. Color: MUTCD green to meet the specifications put forth in Docket Number FHWA-99-6190, RIN 2125-AE67, July 31, 2002.
- Sign panels should be retroreflective per the MUTCD.

Sample logos (high-resolution versions required for actual sign design)

CAPITALIZATION, PUNCTUATION, AND ABBREVIATIONS

Purpose

Consistent use of capitalization, punctuation, and abbreviations is essential for providing legible and accessible signs.

Notes

- Use title case for all signs; the first letter of each word should be capitalized and all others should be lowercase.
- Do not use periods for abbreviations (e.g., “Atwood Ave”) unless necessary to distinguish an abbreviation from another word. For example, the word Capital may be abbreviated as “Cap.” in order to distinguish it from the word “cap”.
- Standard abbreviations for street types should always be used, such as Street (St) or Avenue (Ave). Refer to Table 6 for common abbreviations. When in doubt, look up official USPS Abbreviations online:

http://pe.usps.gov/text/pub28/28apc_002.htm

Table 4: Common Abbreviations in Salt Lake County

Common Term	Abbreviation	Common Term	Abbreviation	Common Term	Abbreviation
Alternate	Alt	Drive	Dr	River	Riv
And	and (not &)	Elementary School	Elem or ES	Road	Rd
Avenue	Ave	East	E	South	S
Bicycle	Bike	Feet	Ft	Salt Lake City	SLC
Block	Blk	High School	HS	Southwest	SW
Boulevard	Bldv	Highway	Hwy	Station	Sta
Bridge	Br	Junction	Jct	Street	st
Capital	Cap.	Lake	Lk	Terrace	Ter
Campground	Cg	Lane	Ln	Trail	Trl
Canyon	Cyn	Lower	Lwr	Upper	Uppr
Center	Ctr	Middle School	Middle or MS	University of Utah	U OF U
Circle	Cir	Mile(s)	Mi	West	W
Community	Comm	Mount	Mt	Utah	UT
County	Co	Neighborhood	Nbhd		
Court	Ct	North	N		
Creek	Crk	Parkway	Pkwy		
Crossing	Xing	Pedestrian	Ped		
Downtown	Dwtn	Recreational	Rec		



5. Sources

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